Amendments to the Specification

Please replace the paragraph at page 5, lines 10-20 with the following amended paragraph:

The fuel-air mixture varies with altitude because the level of oxygen in the air decreases. If the same fuel is delivered to the combustion chamber with less oxygen being supplied, the fuel-mixture is referred to as "rich" because all of the fuel in the fuel-air mixture is not being burned in the combustion chamber. The unused fuel is released with the exhaust gases. As the fuel-air mixture gets richer, the power decreases because the engine cannot burn the excess fuel in the fuel-air mixture. The engine cools as the power decreases and the ~~engine~~ <u>exhaust</u> gas temperature and cylinder head temperature drop accordingly. The process for controlling the ratio of fuel to air in the fuel-air mixture is referred to as leaning. The mixture is leaned by reducing the percentage of fuel in the mixture and enriched by increasing the percentage of fuel in the mixture.

Please replace the paragraph at page 5, lines 27 through page 6 line 4 with the following amended paragraph:

In one embodiment, the piston engine is a six cylinder fuel injected air cooled engine, for example, piston engines manufactured by Teledyne Continental Motors such as Model Number IO-360-ES or Model Number IO-550-N. In a fuel injected engine, the fuel is injected individually into each cylinder. However, the invention is not limited to these particular six cylinder engines. The invention can be used for any piston engine, irrespective of the number of cylinders <u>or type of engine</u>.

Please replace the paragraph at page 6, lines 5-12 with the following amended paragraph:

Each cylinder in the engine has an Exhaust Gas Temperature (EGT) probe that measures temperature of the exhaust gas output from the cylinder and a Cylinder Head Temperature ~~probe~~ (CHT) probe that monitors temperature of the cylinder. In a preferred embodiment, the MFD 100 acquires the temperature sensor data through the sensor interface unit 108 at a rate of 5 Hz with a resolution of 12 bits (4096 levels). The EGT and Fuel Flow (FF) data are useful to the pilot operating the aircraft engine during cruise flight to conserve fuel and extend range.

Please replace the paragraph at page 6, lines 13-21 with the following amended paragraph:

Fig. 2 is a graph illustrating the relationship between power and exhaust gas temperature with respect to fuel flow in one cylinder in an engine. As shown, as the fuel flow to the cylinder is increased, the exhaust gas temperature reaches a peak temperature at 150. The exhaust gas ~~temperature decreases~~ temperatures decrease from the peak temperature as the fuel flow is increased. To set the fuel flow for best power, more fuel is added to the mixture after the exhaust gas temperature reaches the peak exhaust gas temperature, until the ~~engine~~ exhaust gas temperature reaches a temperature that is within a best power limit below the peak ~~engine~~ exhaust gas temperature. At 152, the fuel flow is set for best power with the fuel flow set for "rich of the peak". As shown in Fig. 2, the power at point 152 (best power) is greater than the power at the peak temperature.

Please replace the paragraph at page 6, lines 22-27 with the following amended paragraph:

To set the fuel flow for best economy, the fuel flow is decreased after the EGT ~~temperature~~ has reached the peak temperature 150 until the ~~engine~~ exhaust gas temperature reaches a temperature that is within a best economy limit below the peak ~~engine~~ exhaust gas temperature. At point 154, the fuel flow is set for best economy with the exhaust gas ~~temperature~~ temperatures set for "lean of peak". As shown in Fig. 2, the power at point 154 (best economy) is less than the power at the peak temperature.

Please replace the paragraph at page 6, lines 28 through page 7 line 1 with the following amended paragraph:

Thus, the ~~Exhaust~~ exhaust gas temperature (EGT) in each cylinder is used to set the fuel flow for best power (rich of peak) and best economy (lean of peak). The EGT is typically used as an aid for mixture leaning in cruising flight at 75% power or less.

Please replace the paragraph at page 10, line 18-29 with the following amended paragraph:

The gauge section 204 provides ~~analog and digital~~ graphical and numeric readouts of Revolutions Per Minute (RPM) 206, Manifold Pressure 208, Percent Power 210, Oil Temperature 212 and Oil Pressure 214. The RPM gauge 206 displays current engine speed in revolutions per minute as reported by the SIU 108 (Fig. 1). The manifold pressure gauge 208 displays current engine pressure in inches of mercury as measured at the engine's induction system and reported by the SIU 108 (Fig. 1). The percent power gauge 210 indicates the current percent power being made by the engine. This indication is calculated by the MFD based on engine RPM, manifold pressure, outside air temperature, and fuel flow. The Oil Temperature gauge 212 displays the current engine oil temperature in degrees Fahrenheit as reported by the

SIU 108 (Fig. 1). The Oil Pressure gauge 214 displays indicated engine oil pressure in pounds per square inch (PSI) as reported by the SIU 108 (Fig. 1).

Please replace the paragraph at page 13, lines 16-24 with the following amended paragraph:

At step 416, the system/routine checks if the EGT of the cylinder has dropped to within the best power limit of the engine as specified by the engine manufacturer. In one embodiment, the EGT for that cylinder is within the best power limit when it is between 65 °F and 85 °F less than the peak EGT. Thus, the best power temperature range is 65 °F and 85 °F less than the peak EGT, with an upper best power limit temperature of ~~85~~ <u>65</u>°F and a lower best power limit temperature of ~~65~~ <u>85</u>°F. Once the EGT of the cylinder is within the best power limit, the display 106 annunciates "Peak Detected (Rich)" after it determines the peak EGT and processing continues with step 418.

Please replace the paragraph at page 16, lines 11-16 with the following amended paragraph:

Fig. 6 illustrates the engine page shown in Fig. 3 after the best economy has been achieved. The text "Best Economy" appears above the bar graph. The text "last" appears over the bar representing cylinder #1, for example, the last cylinder to peak. The color of all the bars corresponding to EGT has been changed from green to cyan as each of the EGTs peaked. The numeric representation above each bar indicates that the EGT temperature is ~~lean of~~ <u>below</u> the peak EGT.

Please replace the paragraph at page 16, line 23, through page 17, line 8 with the following amended paragraph:

Fig. 7 illustrates a map page 600 including data blocks 610, 602 providing engine parameters. The map page 600 shows the terrain, the position of the aircraft 606 and the flight

path 608. During normal cruise operation the pilot displays the engine parameters on the Map page 600 to monitor the engine parameters. In the present invention, the Map Page 600 includes data blocks which provide additional information to the pilot. The Lean State Data Block 610 indicates the Lean Assist Leaning State of "Best Power", "Best Economy", or indicates a change in fuel flow or power. The Lean State Data Block 610 indicates "Economy" or "Power" when the lean assist procedure 102 is completed. The Lean State Data Block 610 indicates "Leaning . . ." when the pilot switches back to the map page 600 before the lean assist mode was exited (that is, during lean assist function in-progress). The Lean State Data Block 610 indicates "Incomplete" when the lean assist mode is exited prior to achieving best power or best economy. The Lean State Data Block 610 indicates "FF Change" when the lean state (i.e. "Economy" or "Power") is no longer valid ~~caused by~~ due to a fuel flow adjustment. The Lean State Data Block 610 indicates "Power Change" when the lean state is no longer valid ~~caused by~~ due to a power adjustment.